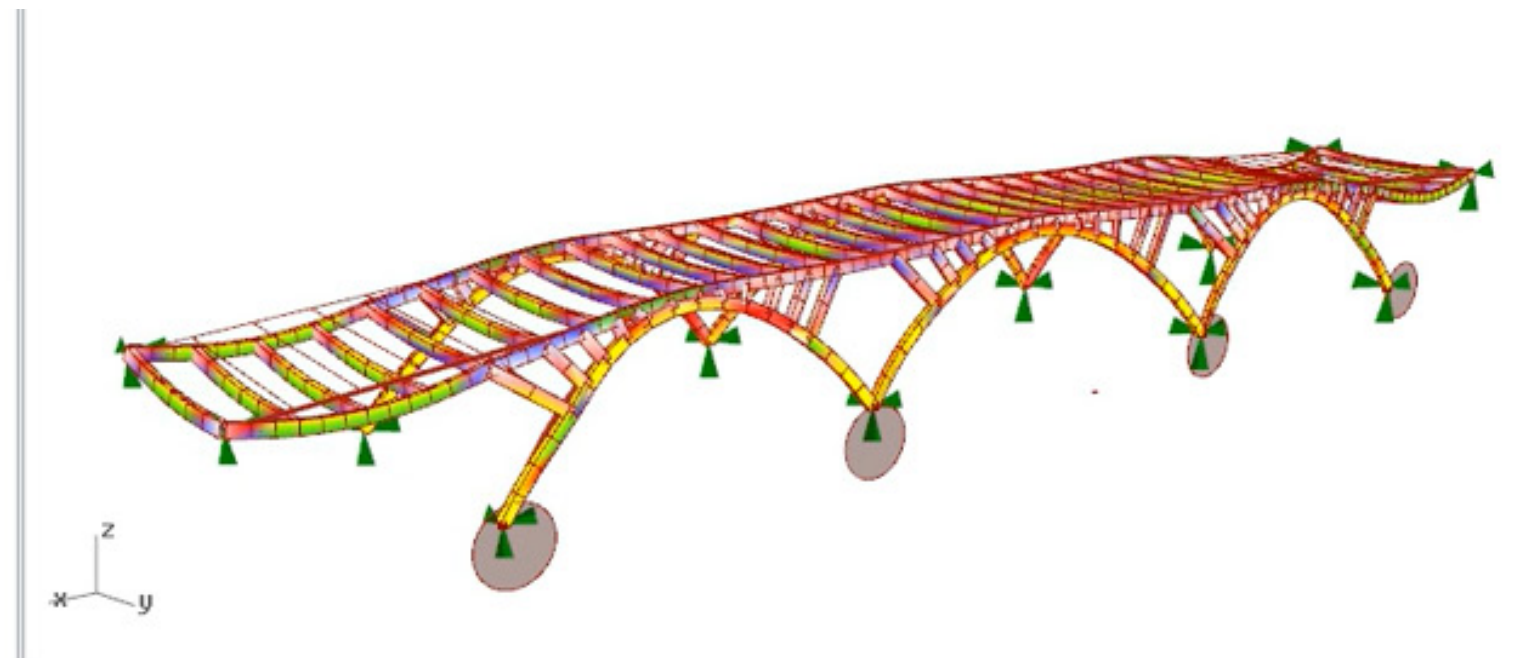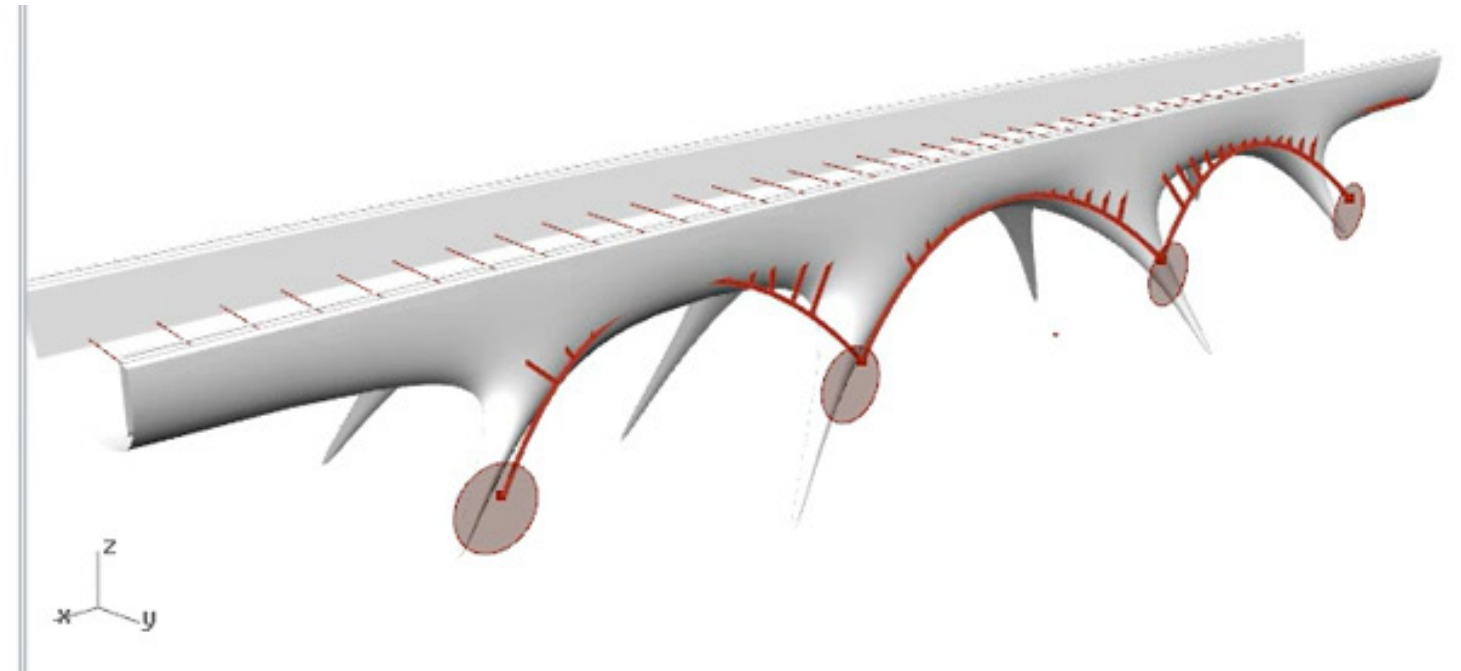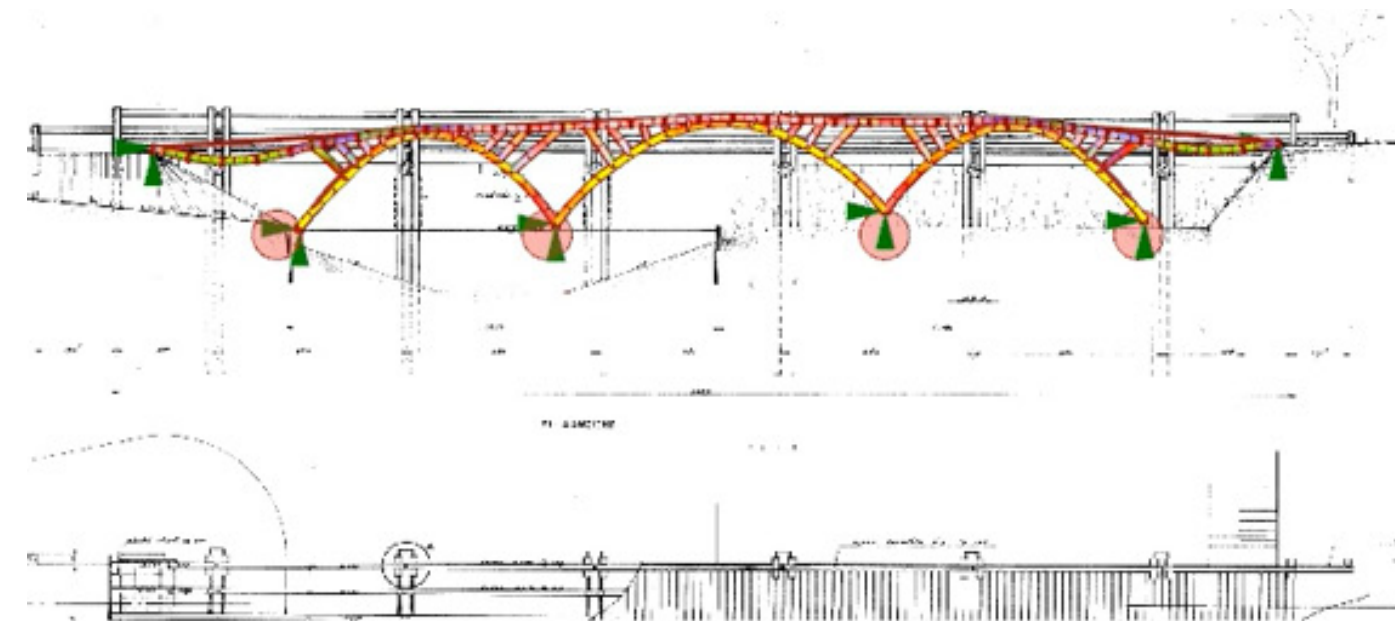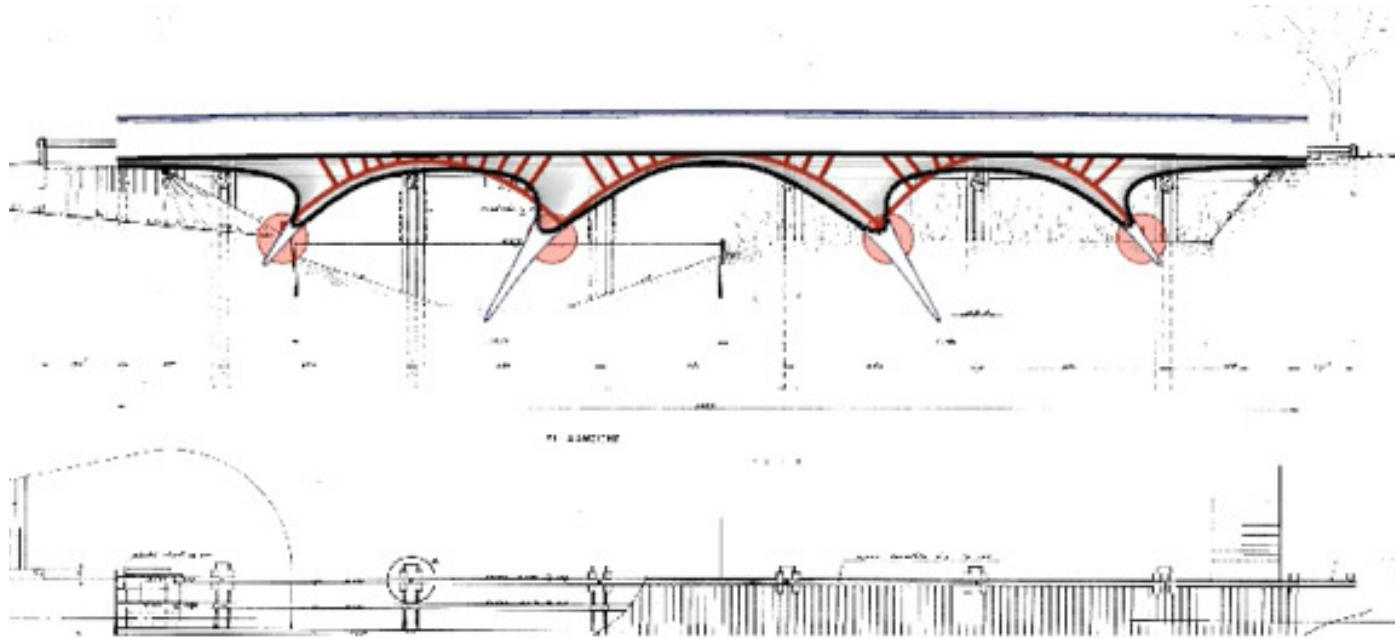 Modeling for rendering

□ MODELING FOR RENDERING

Night picture of the Magic Garden installation at the Karen Millen Store on Regent Street. Photograph by Agnese Sanvito
© Mamou-Mani © Agnese Sanvito

- Technical modeling for analysis
- [using built-in analysis package - Karamba]

- Technical modeling for analysis
- [using built-in analysis package - Karamba]
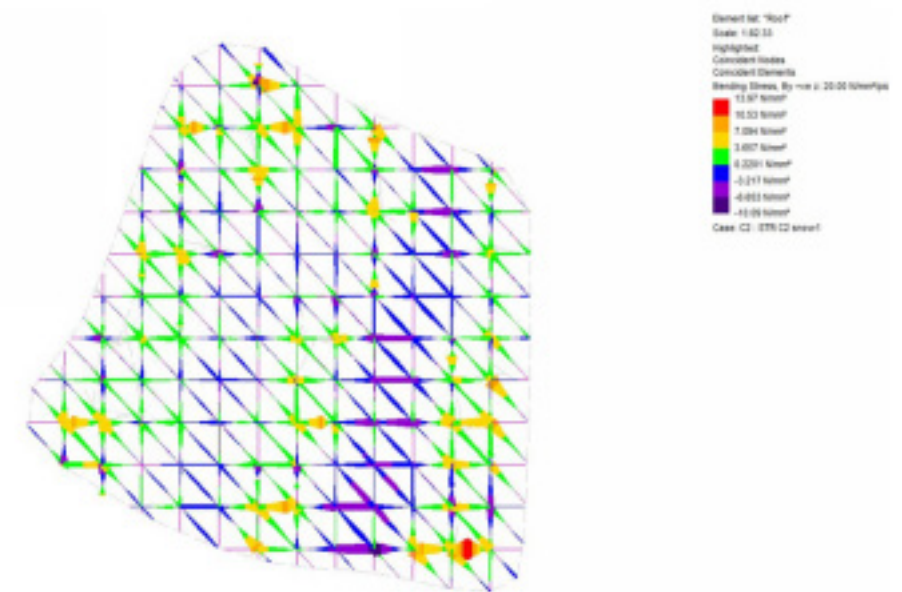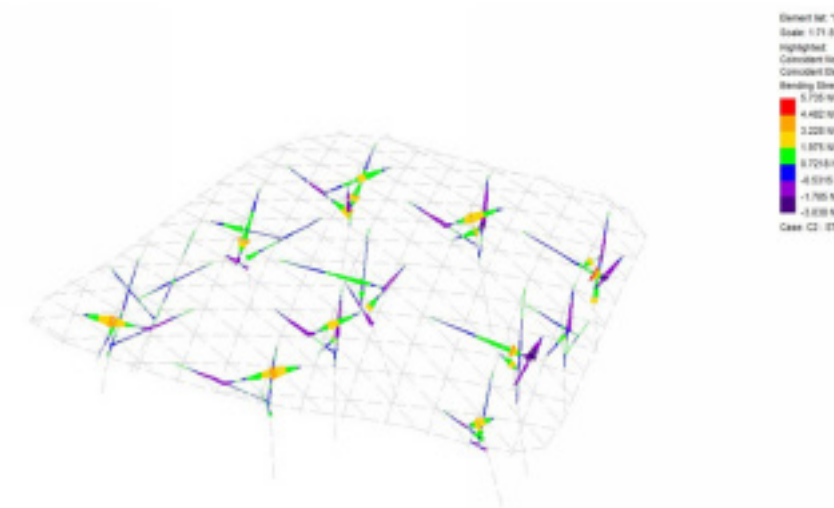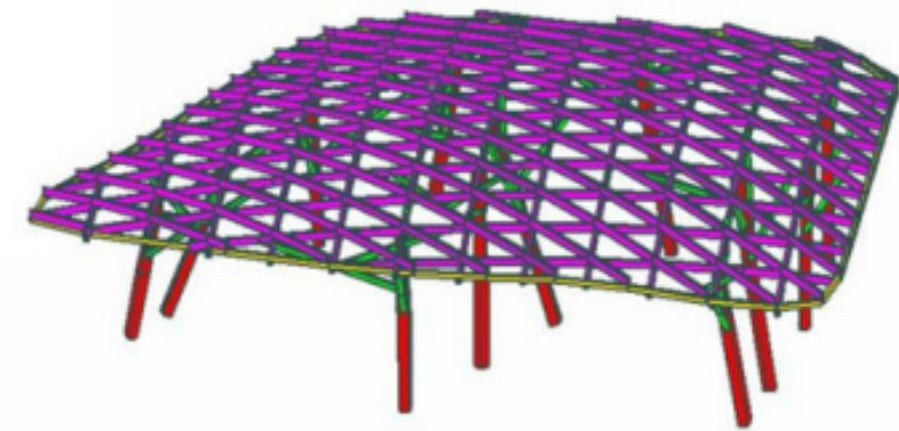
☐ Data visualization

MODEL OF GALLERY SPACE

Art Area

Acclimation Area

HEAT MAP

1. *The Triumph of Asmillus Paulus* (Carie Vernet, 1789)
2. *Ancient Rome* (Giovanni Paolo Panini, 1757)
3. *The Vocation of Saint Aloysius (Luigi) Gonzaga* (Guernico, 1650)
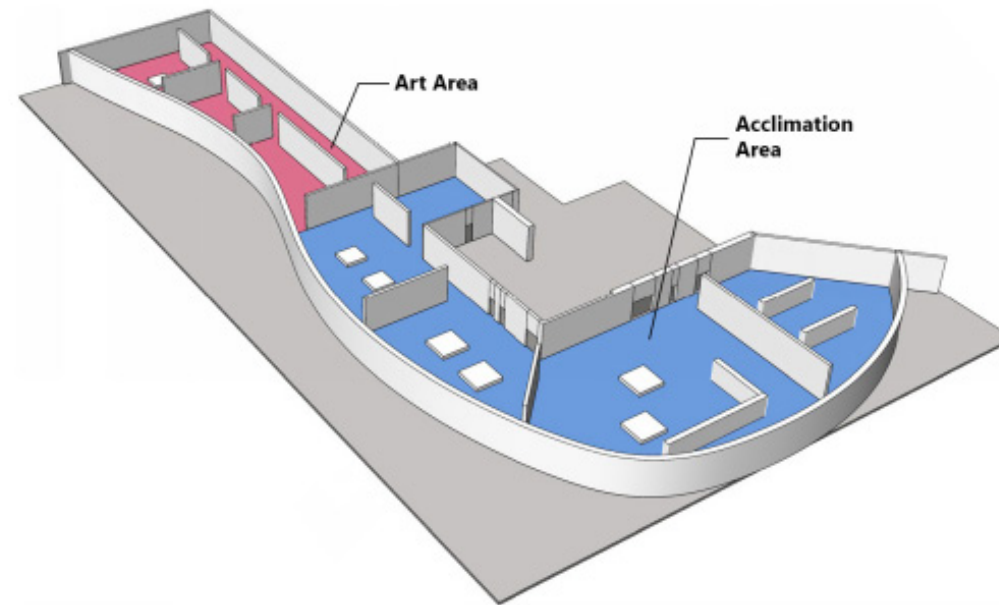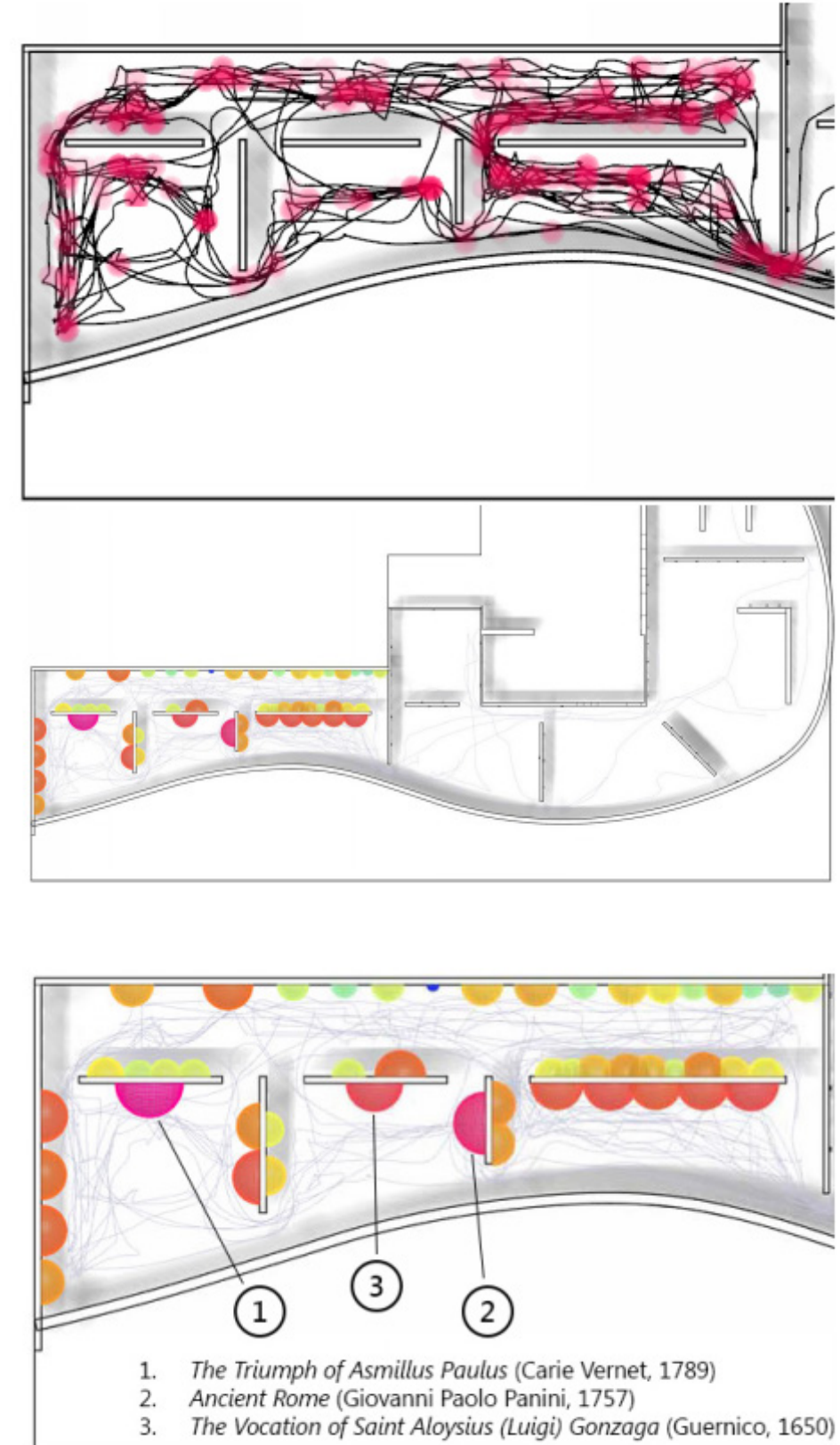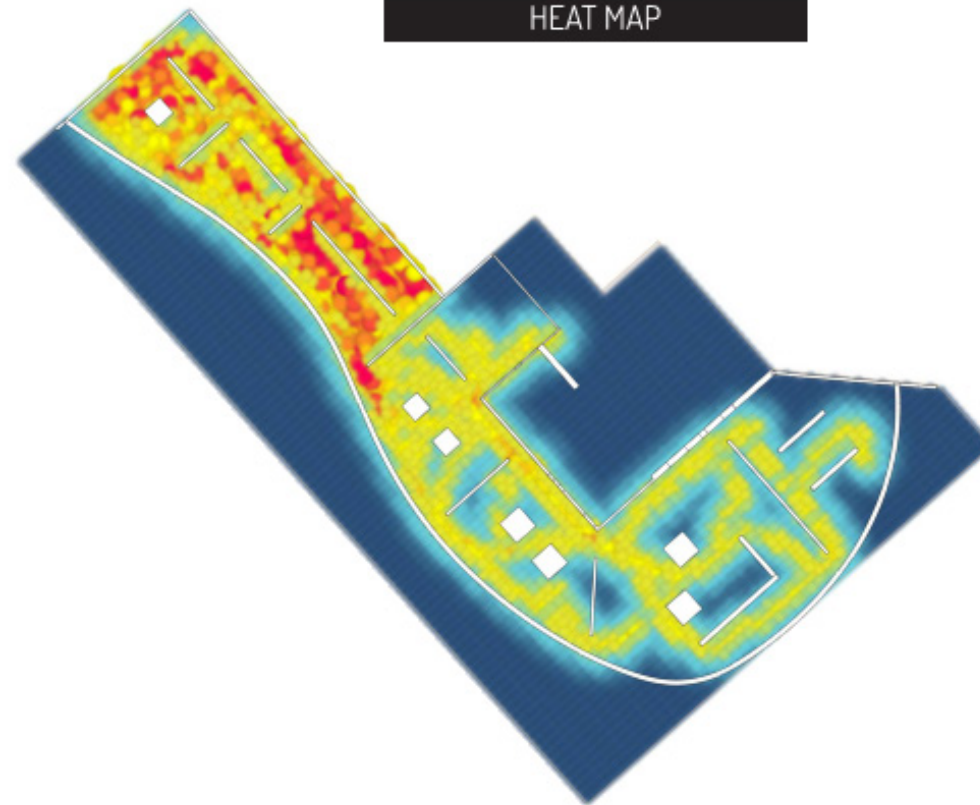
- Platform for parametric modeling with Grasshopper
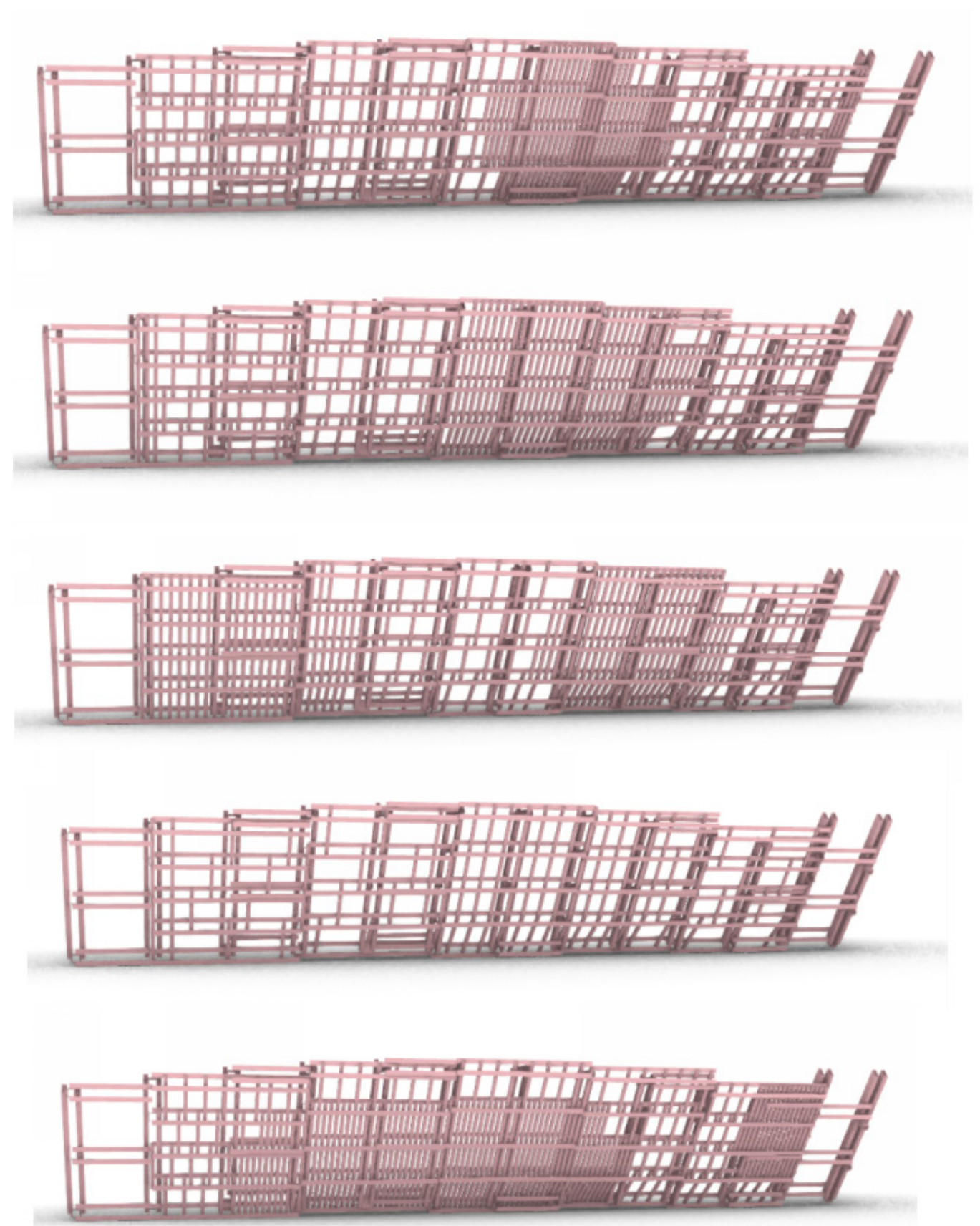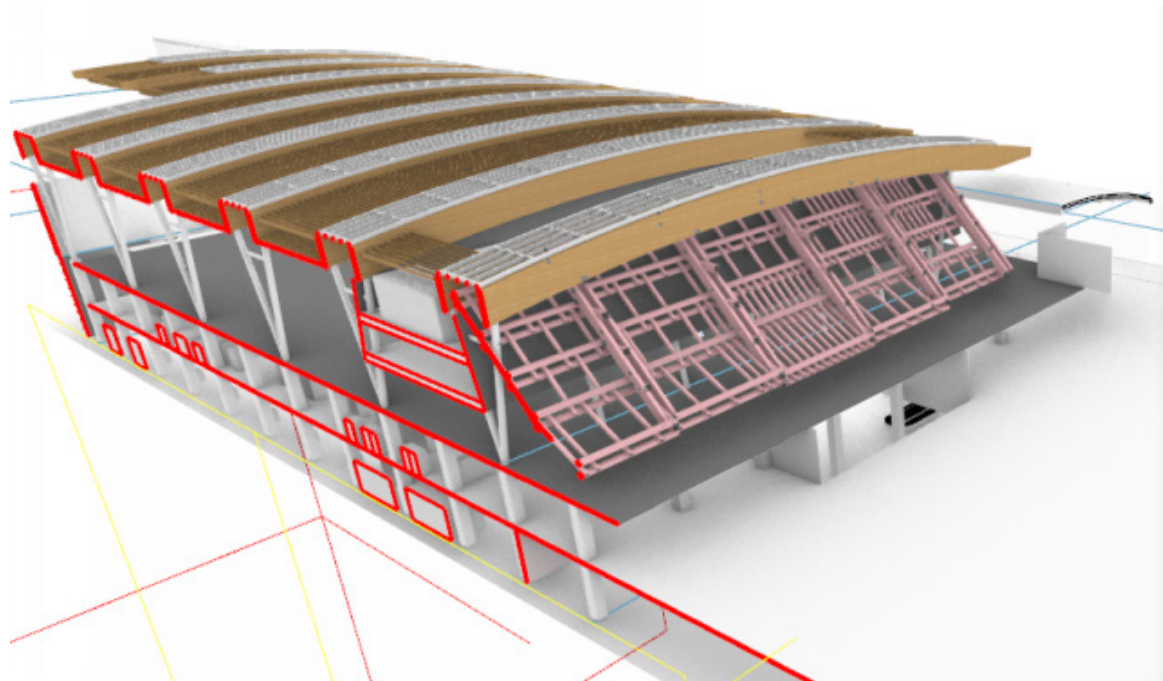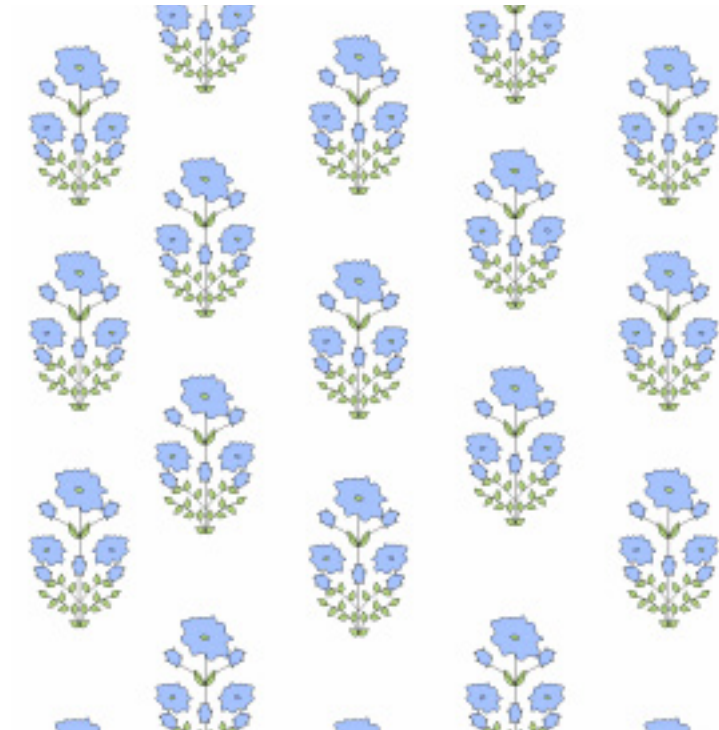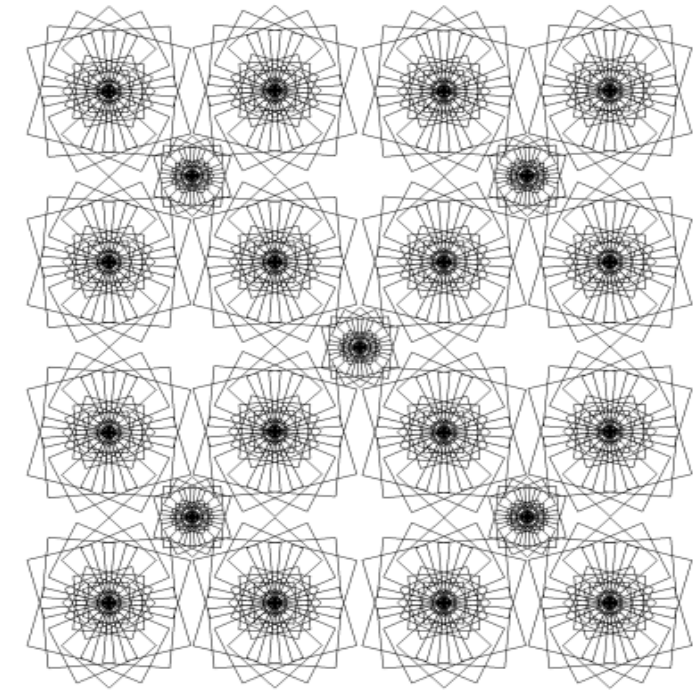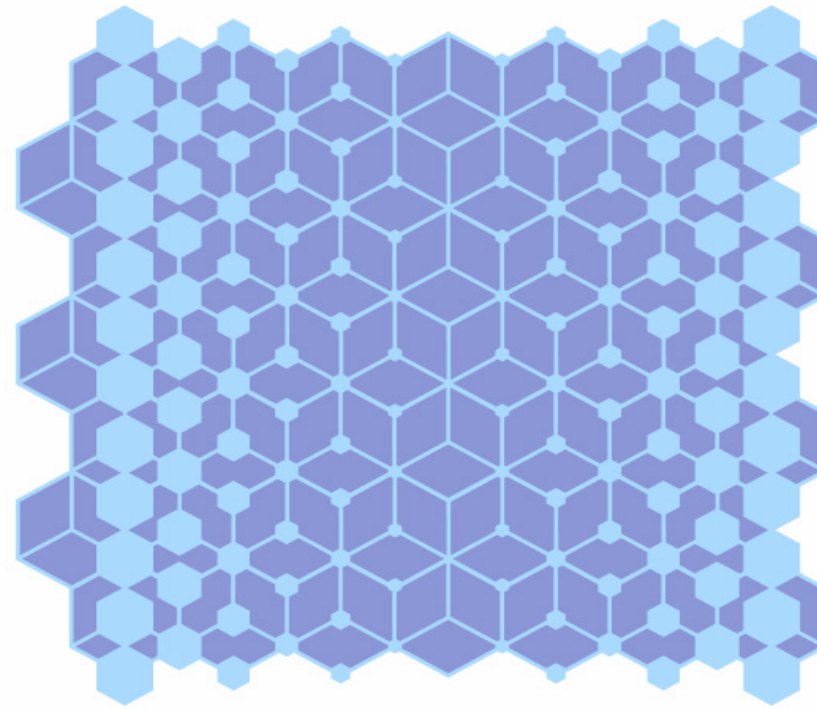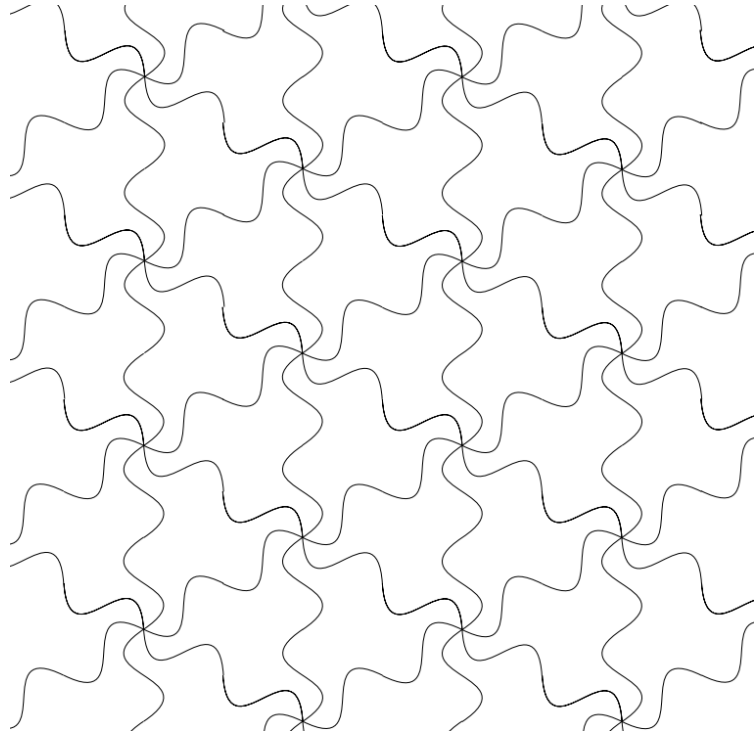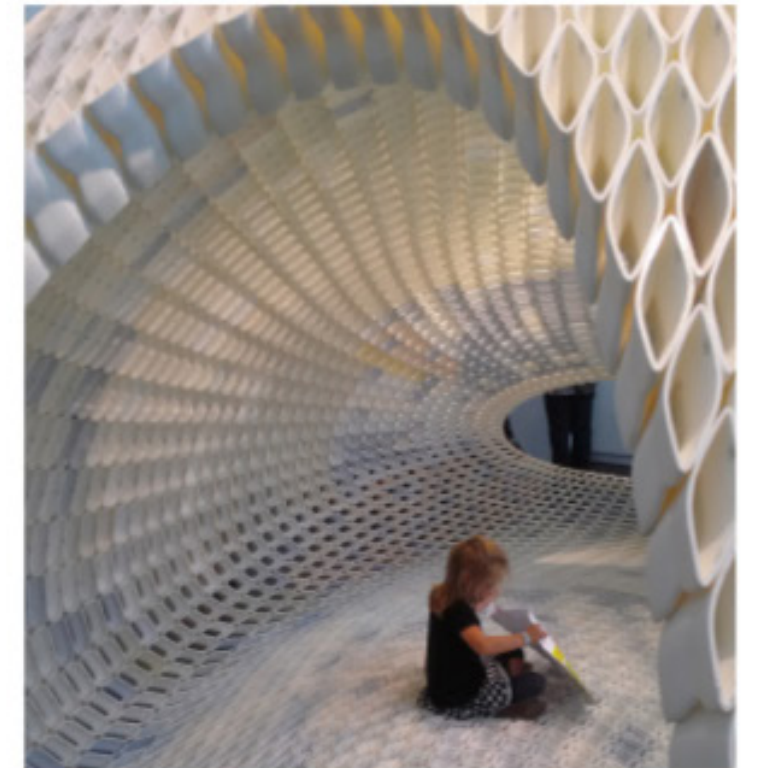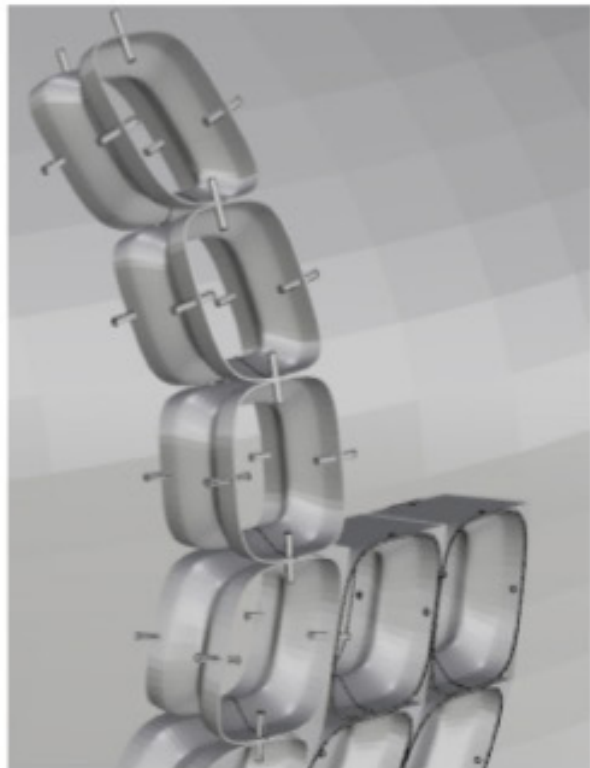
 GRAPHIC DESIGN

☐ DIGITAL FABRICATION

Digital Fabrication

 INTERFACE

2D Drawing

Line   Polyline   Circle   Ellipse   Arc   Nurbs curve   Poly curve
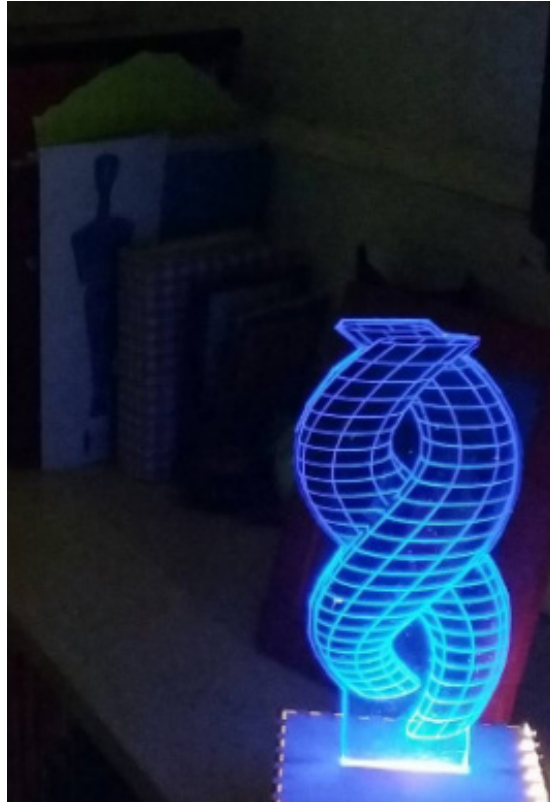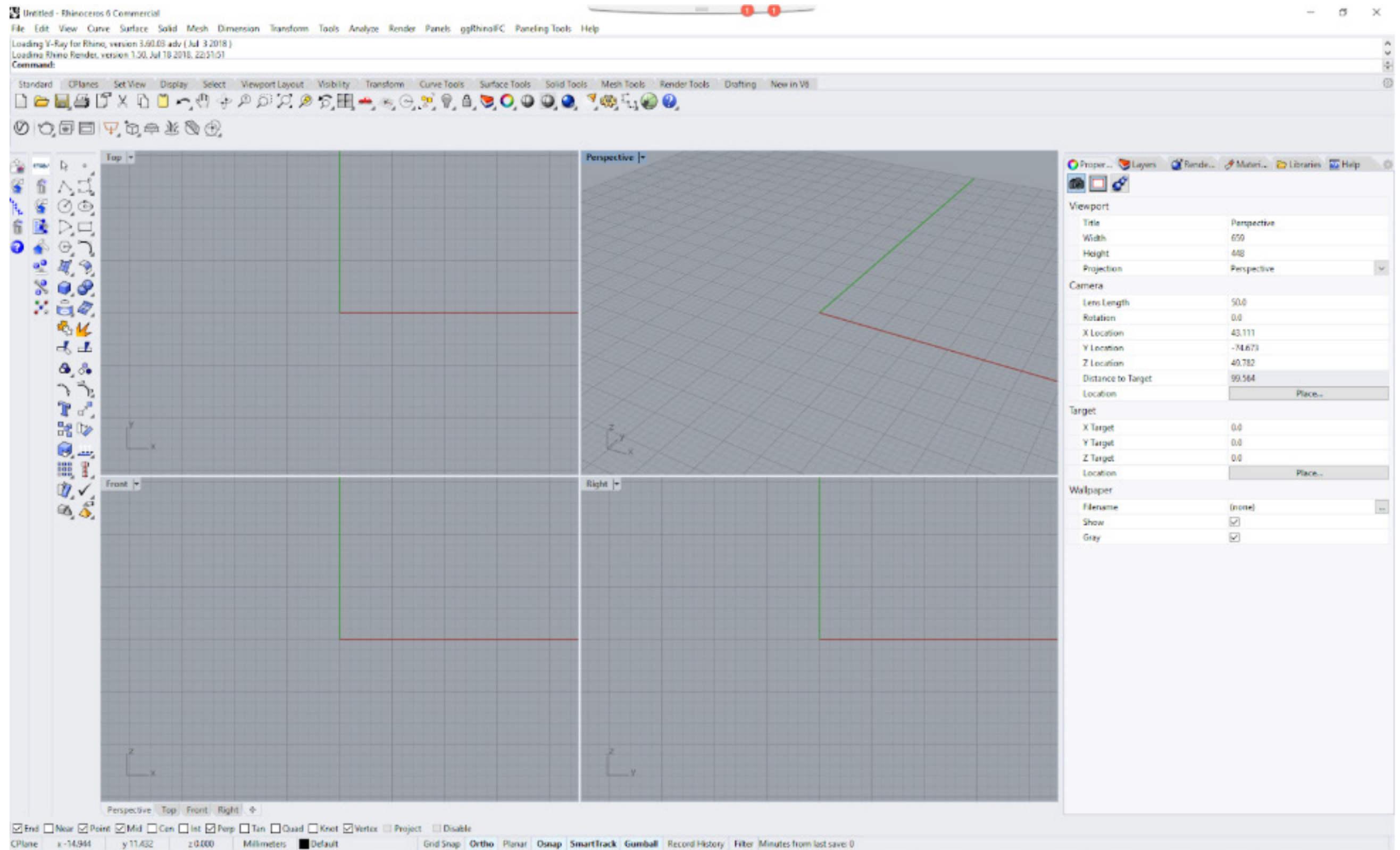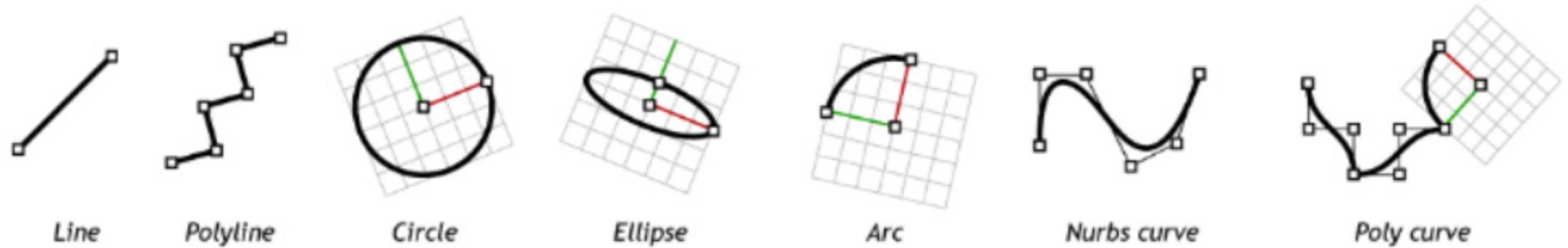
NURBS?!

Non-uniform rational basis spline (NURBS)

Mathematical basis for representing curves, surfaces

NURBS curves defined by control points and the "weights" of these control points

NURBS surfaces are defined by a grid (u, v) of control points

NURBS?!

Origins in ship building!
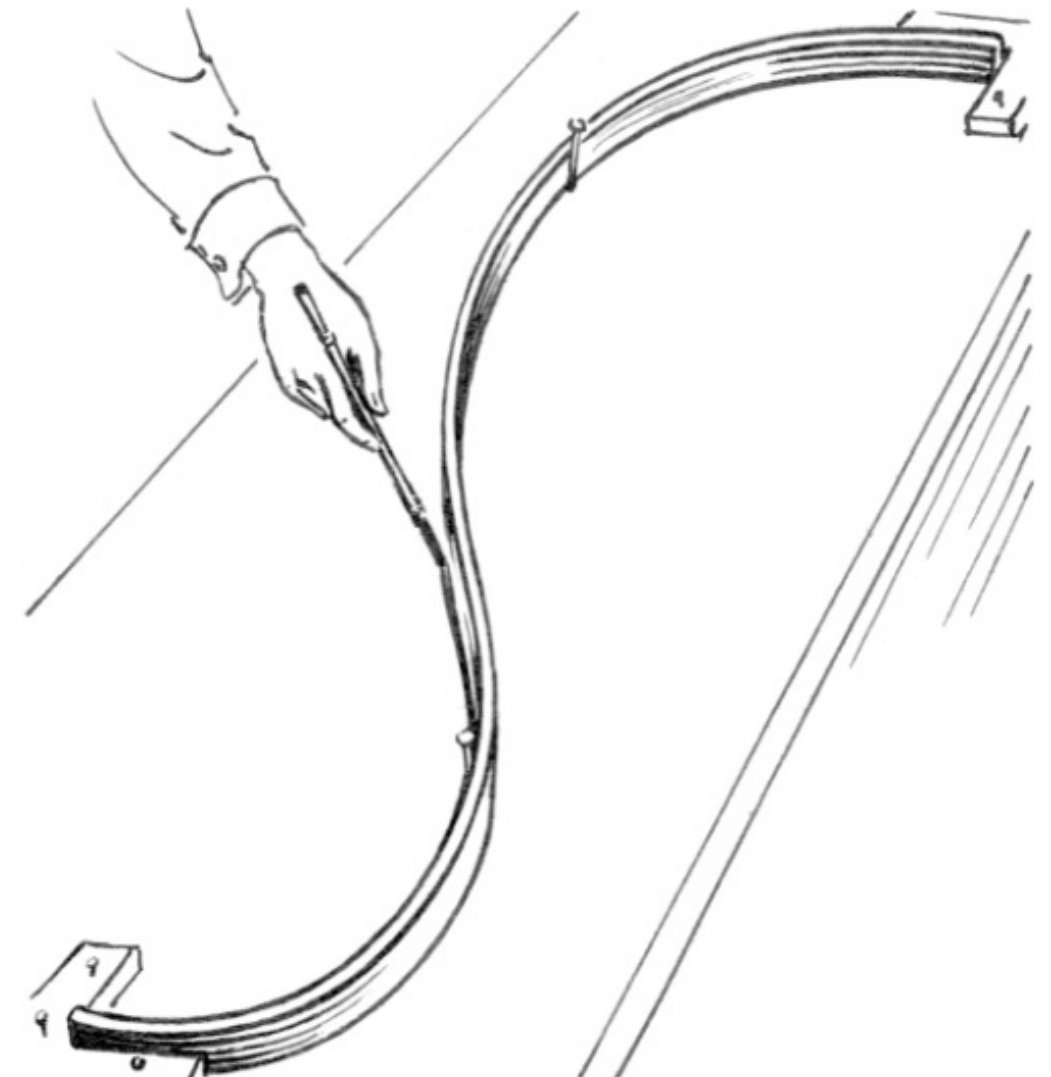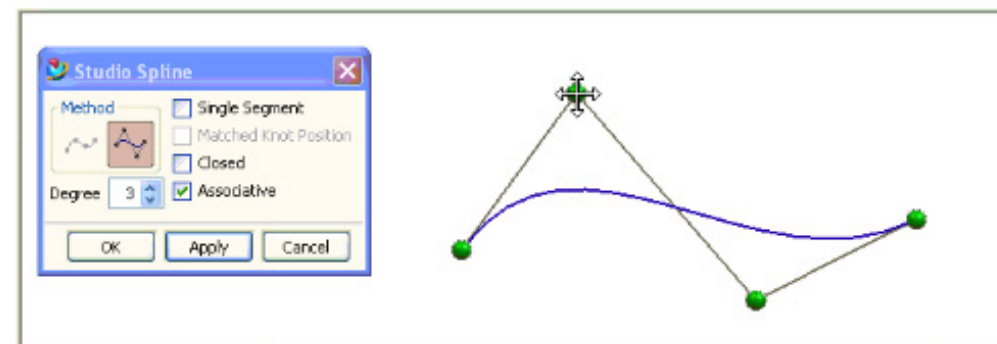
□ NURBS Curve

NURBS Curve is defined by its order, a set of weighted control points, and a knot vector.

Curve is represented mathematically by a polynomial of degree one less than the order of the curve

Control points determine the shape of the curve

Knot vector is a sequence of parameter values that determines where and how the control points affect the NURBS curve.

NURBS curve knot vectors as a result of varying degree

A D^1 nurbs curve behaves the same as a polyline. It follows from the knotcount formula that a D^1 curve has a knot for every control point. Thus, there is a one-to-one relationship.

A D^2 nurbs curve is in fact a rare sighting. It always looks like it is over-stressed, but the knots are at least in straightforward locations. The spline intersects with the control polygon halfway each segment. D^2 nurbs curves are typically only used to approximate arcs and circles.

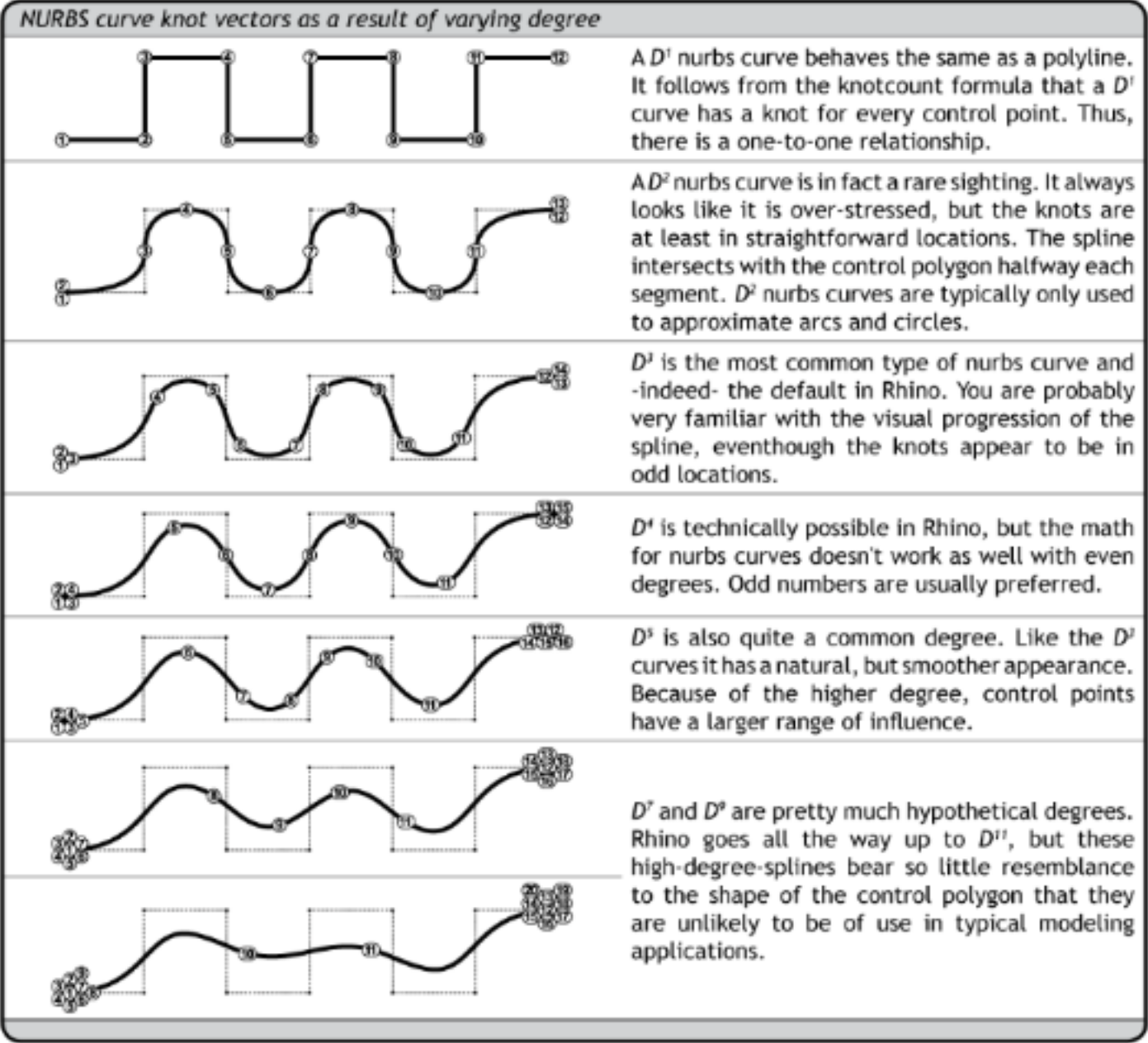D^3 is the most common type of nurbs curve and -indeed- the default in Rhino. You are probably very familiar with the visual progression of the spline, eventhough the knots appear to be in odd locations.

D^4 is technically possible in Rhino, but the math for nurbs curves doesn't work as well with even degrees. Odd numbers are usually preferred.

D^5 is also quite a common degree. Like the D^3 curves it has a natural, but smoother appearance. Because of the higher degree, control points have a larger range of influence.

D^7 and D^9 are pretty much hypothetical degrees. Rhino goes all the way up to D^{11}, but these high-degree-splines bear so little resemblance to the shape of the control polygon that they are unlikely to be of use in typical modeling applications.

 CURVE EDITING AND TRANSFORMATIONS